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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/916,717 | 07/26/2001 | Kenneth R. Hencken | SD-8350 | 9434 |

7590 11/06/2003
Timothy Evans
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EXAMINER

OLSEN, KAJ K

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
| 1753 | |

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,717

Applicant(s)

HENCKEN ET AL.

Examiner

Kaj Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 10 specifies that the electrodes are "embedded" electrodes, but it is unclear what they are embedded into.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al (US 2002/0166592 A1).
6. Liu discloses an electrokinetic pump comprising a fluid flow channel having an inlet and outlet means wherein said fluid flow channel is comprised of patterned microchannels 4 (paragraph 0035 on page 3). Liu further discloses an electrolyte 23 contained in the fluid flow

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channel and in fluid communication with the patterned microchannels, spaced apart electrodes 7, 8 as well as a means for applying an electric potential to the electrodes (paragraphs 0036 and 0037 on page 3).

7. With respect to the microchannel depth, Liu teaches dimensions for the microchannels as low as 0.1 μm (paragraph 0035).

8. With respect to the microchannel width, see last 5 lines of paragraph 0035.

9. With respect to the electrodes being embedded unitary electrodes, they are by themselves and embedding in the electrolyte reservoir and would read on the term "embedded" and "unitary" giving the claim language its broadest reasonable interpretation.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu.

13. Liu set forth all the limitations of the claim, but did not explicitly recite a spacing between the microchannels of about 50 μm . However, Liu does teach adjusting the number of channels that are placed onto a substrate depending on the desired flow rate (paragraph 0035). If it is known to adjust the number of flow channels for a given substrate, then it would have been obvious to one of ordinary skill in the art at the time the invention was being made to adjust the spacing between the channels because the spacing will ultimately dictate how many channels are placed on the substrate. A 50 μm spacing would have been within the purview of one possessing ordinary skill in the art.

14. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Theeuwes (USP 3,923,426).

15. With respect to the claims, Liu set forth all the limitations, but did not explicitly recite any details concerning the choice of electrolyte for the electrokinetic pump. Theeuwes discloses in an alternate electrokinetic pump a number of electrolytes that find utility in the art of electrokinetic pumping. Those electrolytes include aqueous solutions and organic solutions (i.e. methyl and ethyl alcohols) and mixtures thereof that provide the desired high zeta potential, low viscosity, and high specific resistance for electrokinetic pumping (col. 3, line 56 through col. 4, line 12). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Theeuwes for the pump of Liu in order to provide the beneficial high zeta potential, low viscosity, and high specific resistance.

16. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Parce et al (USP 5,995,470).

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17. Liu set forth all the limitations of the claim, but did not explicitly recite the presence of a coating to enhance the density of surface charges. Parce discloses in an alternate electrokinetic pump that coatings can be utilized to enhance the density of surface charges, thereby improving pump performance (col. 8, line 10 through col. 9, line 10). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Parce for the pump of Liu in order to improve the electroosmotic properties of the channels.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The two references Paul et al disclose an alternate electrokinetic pump.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (703) 305-0506. The examiner can normally be reached on Monday through Thursday from 7:00 AM-4:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Mr. Nam Nguyen, can be reached at (703) 308-3322.

When filing a fax in Group 1700, please indicate in the header "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communications with the PTO that are not for entry into the file of this application. This will expedite processing of your papers. The fax number for regular communications is (703) 305-3599 and the fax number for after-final communications is (703) 305-5408.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0661.

A handwritten signature in black ink, appearing to read 'Kaj Olsen', with a stylized flourish extending to the right.

Kaj K. Olsen
Patent Examiner
AU 1753
October 31, 2003